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TOWNSEND and TOWNSEND and CREW LLP

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PATENT
Attorney Docket No. A6123/T43700
AMAT No.
006123/USA/DSM/HDP/CVD//JPFEIFER
TTC No. 016301-043700US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of:

Hichem M'Saad

Application No.: 10/020,461

Filed: November 24, 2004

For: METHOD OF MANUFACTURING AN OPTICAL CORE

Confirmation No. 9343

Examiner: Hoffmann, John M.

Art Unit: 1731

APPELLANT REPLY BRIEF UNDER 37 CFR §41.41

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Appellant offers this Reply Brief in response to the Examiner's Answer mailed on November 14, 2006. The following remarks are intended to further focus the issues in this appeal.

1. Rejections Over Bazylenko and Kyoto and optionally in view of Dragone

A common aspect of the claims is that they recite the formation of optical cores having high refractive-index contrast relative to an undercladding layer using high-density-

plasma chemical-vapor-deposition processes ("HDP-CVD"). The principal reference relied on in the Examiner's Answer, Bazylenko, is directed primarily to the use of plasma-enhanced chemical vapor deposition ("PECVD"), a technique that uses a generally lower plasma density than HDP-CVD (*see, e.g.*, Bazylenko, abstract; Col. 2, ll. 16 – 24). The Answer is correct in its observation that Bazylenko intimates that the PECVD process may use "high" plasma densities (*see, e.g., id.*, Col. 2, ll. 54 – 60; Claim 5). But this intimation is not at all specific. There is no indication of what plasma densities are meant when reference is made to "high" densities so that it is not apparent that Bazylenko is referring to the HDP-CVD process defined in the Application.

Bazylenko is also specific in identifying the refractive-index contrast that can be achieved with its method, namely "ranging from 0.004 to about 0.02," i.e. between 0.4% and about 2.0%. In articulating the basis for rejection, the Answer suggests that other cited art — namely Kyoto — (describing a different technique) teaches that it is possible to achieve higher refractive-index contrasts within the claimed range of a relative contrast "greater than 2.0%." Where the rejection is deficient is in its failure to identify how such larger refractive-index contrasts can be achieved using the methods taught by Bazylenko. All the Answer does is to suggest that the cited art indicates the desirability of such higher contrast under certain circumstances. But a gap still remains in combining the cited art, specifically how such a result is to be achieved using the methods disclosed in Bazylenko. For the rejections to be sustained, the cited art must not only suggest the desirability of the claimed result, but also must enable one of skill in the art to achieve that result.

This gap in the cited art has been filled by Appellant's invention. Specifically, Appellant's disclosure acknowledges that PECVD has been used in the fabrication of optical cores, but that technique suffers from deficiencies when trying to fabricate cores having the recited contrast (Application, p. 3, ll. 8 – 13). Appellant's disclosure teaches that these deficiencies can be avoided by using HDP-CVD, which is defined specifically as using a plasma having an ion density of at least 10^{11} ions/cm^3 (*id.*, p. 5, ll. 26 – 29), with certain dopant precursors. An example of precursors that the disclosure teaches as enabling such contrast includes nitrogen (*id.*, p. 8, ll. 8 – 12) because of, for example, the greater polarization of the

silicon-nitrogen bonds that are formed when such precursors are used. The use of nitrogen precursors is specifically discouraged by Bazylenko (*see, e.g.,* Bazylenko, Col. 2, ll. 22 – 24). Other exemplary precursors are also identified in Appellant's disclosure as enabling the high contrast when used, *e.g.*, in combination with certain embodiments recited in the claims (Application, p. 8, ll. 13 – 19).

One of skill in the art, when presented with the art cited in the Answer, would not be led to the invention because the cited art would not provide any teaching that would enable the high contrast recited in the claims to be achieved. This is true even if there is art indicating that other techniques that suffer from their own deficiencies might be able to achieve such contrasts. At best, a person of skill in the art would be faced with a reference teaching a method of fabricating an optoelectronic device having an optical core with a contrast of 0.4% – 2.0% and with a reference teaching the desirability of higher contrasts. But he or she would have no way of knowing how to achieve such a higher contrast using the disclosed method. Rather, it is Appellant's disclosure that teaches this. Since even the combination of the cited references does not enable the invention as claimed, the claims are believed to be patentable.

2. Rejections Over Johnson and Kyoto and Optionally in View of Dragone

The rejections that rely on Johnson as the principal reference are deficient for similar reasons. Although Johnson is more explicit in suggesting the use of dopants beyond those disclosed in Bazylenko, it does not provide any details that would enable one of skill in the art to understand how to achieve a particular desired refractive-index contrast. The mere fact that Kyoto has some suggestion that a different technique can be used to achieve a refractive-index contrast in the recited range is uninformative with respect to the Johnson technique. Again, one of skill in the art presented with these references would not have any way of knowing how to achieve the recited contrast using the disclosed method. Like the combination using Bazylenko, the combination of references using Johnson does not enable the invention as claimed, and the claims are accordingly believed to be patentable.

Respectfully submitted,

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